مدرسة امباسادور
AMBASSADOR SCHOOL
INSPIRE INQUIRE INNOVATE

STEAM Newsletter

October 2022

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LET'S MAKE MONEY

Students were challenged to set up a food stall "Fun Fair at Ambassador School". They constructed models of different kinds of food such as burger, sandwich, ice-cream, fruit salad, etc. and labelled each food item with its cost. Interesting menu card was designed using 'story visualizer software' to promote their products.
Later they visited each other's groups and purchased the food items using UAE play currency. Students enjoyed the session and got a real life experience of purchasing food.

HOTDAY!

In this activity, Students observed and understood where does wind come from? They were challenged to design and construct a cooling fan using an Early simple machine. They tested their model and manipulated their designs and modified the same (using gears and pulley mechanism) till they were able to showcase the best possible design and solution of high tech cooling fan among all their classmates.

LET'S GO SHOPPING

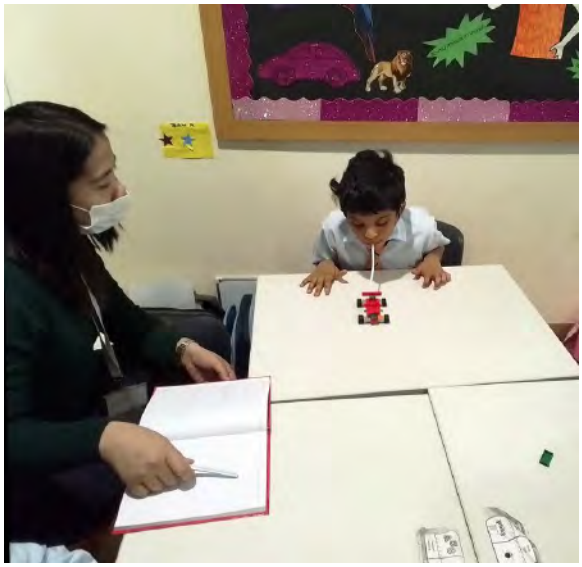
Students were challenged to construct their own Lego supermarket, continued to play a game "A trip to the Supermarket" connecting in-store real life experience where students got an opportunity to purchase and sell the grocery items. Each team got to choose a student to act as the cashier and the rest of the students to be the shopper/customer, then asking them to pay for items using UAE play currency. Simultaneously, they calculated currency by adding and subtracting the amount that needed to be paid to the cashier and returned back to the customer.

Students learned and explored simple operations in math such as addition, subtraction.

READY, STEADY AND BLOW

Students in teams were given a task of constructing a Lego car with their own mechanisms in such a way so that the air will push the car forward by blowing the straw and after testing their cars they were challenged to take part in the car racing which motivated them to modify their cars to make it better and faster.

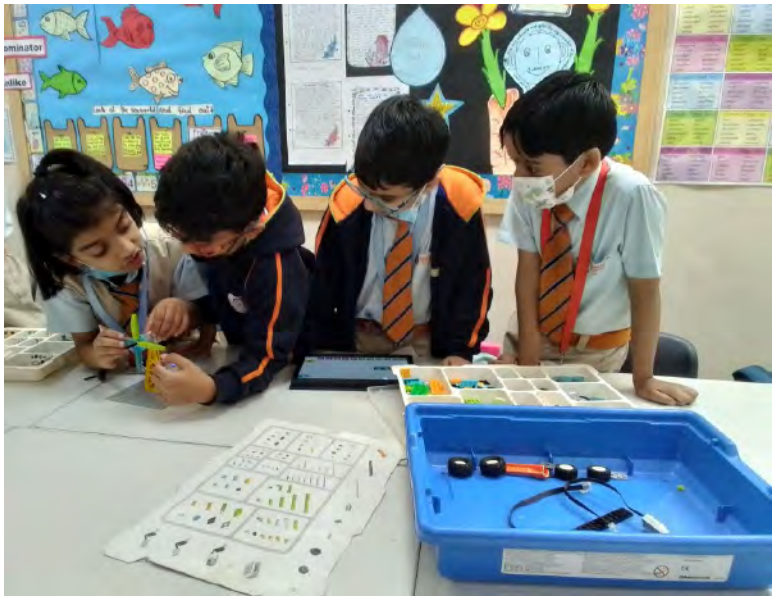
Later young engineers learned and explored the properties of air that the air can move things.



COME LET'S GENERATE ELECTRICITY

A windmill is a machine on a tower that uses rotating blades to convert kinetic wind energy into mechanical energy or electricity. In this activity, students were challenged to design and build a model of windmill using the LEGO WeDo 2.0 kit . They tested their model by varying the programming instructions by connecting smart Hub and motor.

The students were able to showcase the best possible design and solution of a high tech windmill among their classmates by presenting their model how windmill uses the power of the wind to generate electricity.



FRACTION AVENUE

In this activity, student pretended to be mathematician and applied their knowledge about fractions, They identified fractional parts (½, ¼, ,¾) and were set on challenge to construct fraction street using the Lego community starter kit.

Students completed the map of their new street based on fraction problems.

SOLAR POWERED LEGO CAR

The students discussed the United Arab Emirates and how sunlight is available in abundance in this part of the world. They discussed how sunlight can be exploited to generate electricity for a more sustainable living environment.

They worked together as a team to construct a solar powered car and proceeded to attach a motor to the wheels which they connected to a Lego solar panel and used it as the roof of the car. The students were then taken outdoors so that they can see the car moving in the presence of sunlight and slowing down and coming to a stop when it enters a shaded area. They analysed that when sunlight falls on the solar panel, photovoltaic cells present in solar panel convert heat energy to electrical energy.

This project encouraged the students to explore the various uses of alternative energy, leading an initiative to understand about the importance of renewable source of energy to attain sustainability. After all, we need more Green Engineers in the future to come!

FESTIVAL OF LIGHTS

In this activity, students were challenged to design and construct a pattern of rangoli and diyas using Lego community starter by applying the concept of multiplication.

They illustrated the importance of designing a pattern of rangoli and Diyas as a part of religious festival.

SEE IT! HEAR IT ! CODE IT! WITH MTINY

Students learned the basics of coding by using mTiny robot and coding cards based on the given role-playing activity Help Me, Please!. In this activity, students need to judge whether mTiny the Nurse and mTiny the Policeman should stop on the map blocks to fulfill their duties. If the robot departs from the Hospital Map Blocks, then it should play the role of the nurse and help the injured passer-by, if it departs from the Police Station Map Blocks, it should play the role of the policeman to catch the thief.

Later, students measured the total distance travelled by the mTiny robot and convert it from cm to m.

SHADOW THEATRE

Students applied their knowledge of light to create a shadow puppet show in their designed Lego mini-theatre.

They investigated how the size and shape of their shadow puppet changes with the variation in distance from the light source. They also expressed the changes by measuring the size of the shadow puppet (lengthwise).

The main objective of this lesson was to explain and model how a light source close or far from the object affects the size of the shadow.

PULLING BOT

In this activity, students investigated the effects of balanced and unbalanced forces on the movement of an object, the students constructed a pulling bot using building instructions from WeDo 2.0 software. They explored these forces by adding different weights in the form of tires to their carts and programming the pulling bot to pull the cart with weights. They found that after adding a max of 4 tires, the bot was unable to pull as the gravitational force of the weight was more than the pull force of the bot.

MUSIC WITH MBLOCK SPRITE!

Students created a musical instrument by adding a music sprite extension in mblock.
They programmed the instruments to make sounds when clicked by selecting the proper notes, instruments, volume, tempo etc.

Students explored some of the commands from the mBlock coding platform.

PARK OF SIMPLE MACHINES

We use machines every day to make our work easier. The compound machines that we use are oftentimes made up of multiple simple machines such as pulleys, levers, and inclined planes. Each simple machine serves a purpose to change force, thus making work easier. Simple and compound machines are not just for work though; they can also be used to create fun such as the rides at an amusement park!

In this activity students in teams designed an amusement park of simple machines. Teams worked in collaboration planned to design their own park of simple machines. They played the roles of architect, mechanical engineer, locomotive engineer etc. and divided the work to finish the task on time. They build the see saw, inclined plane, Ferris wheel etc. and programmed at least 1 machine to show the working of it.

After the building teachers inquired about the simple machines used in the park and role of angles and shapes in it. Students were then encouraged to go around on other tables to see and learn from others creativity in building the park.








SYMMETRICAL ART

Symmetrical balance (or Symmetry) means that the work of art is the same on one side as the other, a mirror image of itself, on both sides of a center line.

In this activity students were introduced to a new tool called mtiny robot that works on the technology of tap to code. Students then asked to explore it by coding it to move in different direction and then challenged to draw a symmetrical art using the pen feature of the robot. Teams started with some basic shapes such as square, triangle and circle and then using the basic shapes they thought to make an art work.

Students were really excited to see the robot drawing an art of symmetry.






SYMMETRICAL ART 2

Students worked in groups to operate the tiny robot to produce symmetrical artwork using green coding blocks such as circles, hexagons, squares, and rectangles.

Students used the various forms to make symmetrical artwork. Teams showed their artwork to the class after finishing it, and the winning team was awarded house points. The lesson was enjoyable, and the students produced beautiful symmetrical artwork. The various symmetry lines were also covered with the students.

SUSTAINABLE CITY

A sustainable city is one that uses urban planning and city management to solve issues of social, environmental, and economic effect. By incorporating eco-friendly options into city infrastructure, including adopting pedestrian and bike lanes, many sustainable efforts can be realized.

Teams of students were given the task of creating and displaying a LEGO sustainable city model. Students worked in groups to design a city model with buildings of a specific perimeter and area and add a working model of renewable energy sources such as wind turbines, solar power, etc. using SAM labs and the Lego WeDo 2.0 set. Students role-played as architects, mechanical engineers, environmental engineers, automobile engineers, etc.
Some city models came very well and others learned and modified. Overall it was a fun and learning activity where teams understood how important it is to work in a team to achieve the goal.

At last teams were asked to move around and see the models of other teams and reflect on what mistake they have done in their design and what they have done better.

MY SUSTAINABLE CITY2

Previous week students designed the sustainable city using Lego but its was observed that mostly students used only wind and solar energy to make their city sustaible since the resources was a limitation. This week students were encouraged and challenged to deign a 3D model of their city using TinkerCAD modelling application.

Students in teams uses the collaboration tool of TinkerCAD and worked to design a sustainable city model. This time teams uses more creative ideas and designed park, mountains, lakes etc around their city and made the city more natural and sustainable. They were asked to use more renewable energy sources such as





LEVER BRIDGE

A drawbridge or draw-bridge is a type of moveable bridge typically at the entrance to a castle or tower surrounded by a moat.

In this activity students in teams challenged to engineer a draw bridge using the principle of lever. In this activity students planned to engineer the bridge using the principle of lever. Students understood the different class of lever and their application in real life.

Students in teams used WeDo kit to build a lever bridge and then using motor to make it autonomous and then presented their model in front of the class and explain the lever types in it.

MAGLEV – THE FASTEST TRAIN

A floating vehicle for land transportation that is supported by an electromagnetic force is known as a maglev, also known as a magnetic levitation train or a maglev train.
Students were given the task of designing the maglev bogie utilizing the magnets and the chassis before testing it on the unique magnetic track. Magnets were used to begin the activity by teams of students. After ensuring that the magnets' poles were aligned properly, they adhered them beneath the cardboard framework using glue or cello tape. The maglev was then tested on the track. Only a small number of groups initially succeeded because some teams failed to verify the track and chassis dimensions. After realizing their errors during the debate, the teams decided to create a new structure for the following activity.

MAGLEV – THE FASTEST TRAIN 2

Teams elected to redesign their maglev bogie in accordance with the previous activity's guidelines. Teams first verified the track's width, kept their chassis dimensions within bounds, linked the magnets under the chassis to make it levitate on the track, and then moved their maglev bogie by tilting the track.
Teams then computed the speed of the bogie using the length of the track and the time required. After making the maglev bogie quicker by adding weight to it, they checked its speed once more. Some of the teams loved creating the chassis and decorating their bogies beautifully while also succeeding in making their bogie faster.

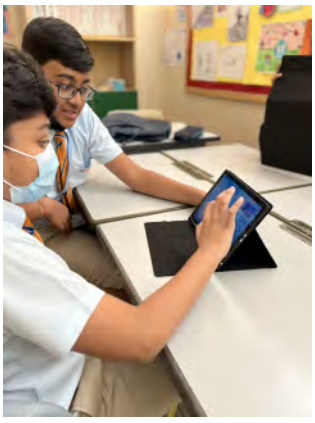




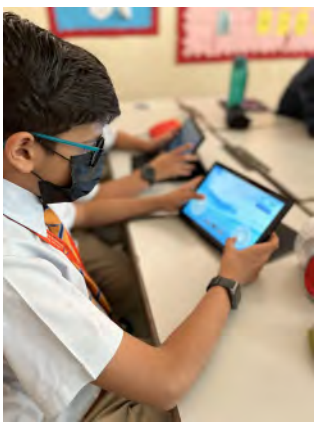

AIR BLOCK DRONE

Airblock is a programmable, modular drone that is simple to assemble. It may evolve into a variety of shapes, including drones, hovercrafts, and other devices.
The air drone blocks were presented to the children in this activity. Before really flying the drone, teams were instructed to read the rules and regulations. After that, the regulations to ensure the safety of the students and the drones were discussed.
Students were invited to pilot a virtual drone using a drone simulator. When the students were prepared to fly the drone, they were requested to take the actual Airblock drone and put it together according to the provided instructions. The teams were then instructed to place their drone outside and operate it safely while following safety procedures.







FRICTION IN ACTION

Friction is a force that prevents two solid objects from rolling or sliding over one another.
Building an EV3 robot and utilizing Bluetooth to connect it to the EV3 classroom application were the objectives of this project for the teams of students. The next task for the students was to design a testing area for the friction test.
Teams constructed a robot and used it to drag a weighted bottle across a surface before measuring the distance the robot traveled by dragging the bottle with various wheels. The wheel that traveled the furthest was also the one with the most friction. Following the testing, the teams were given the "SUMO ROBO" task. Each team received one round, and the robot that survived to the end won the game..
Students wanted to tweak their robots and take part in the sumo robo challenge again because they enjoyed it so much.






FRICTION IN ACTION 2

In order to push the other robot with more force, teams were requested to modify their robots as part of the ongoing SUMO ROBO competition (friction). Teams came up with a variety of concepts; some modified the wheels while others created 3 or 4 wheel driven drives that could propel another robot more forcefully.
Multiple trial and test rounds as well as two final rounds were offered to the teams. Teams that finally took home the victory came forward to discuss their experiences and lessons learned.
The discussion of how friction is used practically in everyday situations, such as in cars, brought the activity to a close.

FOLLOW THE LIGHT

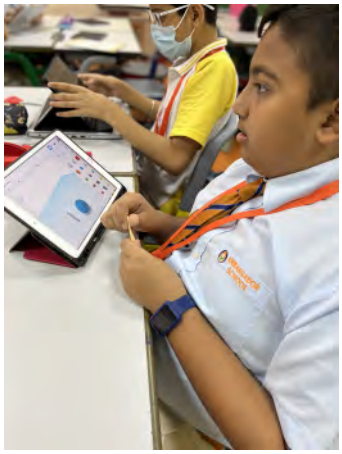
A light follower robot is a moving robot that can detect light (such the light from a flashlight) and proceed in the same direction as the light. These robots come in handy in a variety of emergency scenarios. A good example would be a smoke-related fire evacuation.
Students built a Spike Prime robot and attached a light/color sensor to it in this project. Students programmed the robot to recognize various color bricks and recite their names based on the light hue reflected from them after connecting the robot hub to the application. They were then instructed to set up the robot so that it would move when the color green was displayed, pause on yellow, and stop on red.
Then, teams were urged to consider how to instruct the robot to follow light.

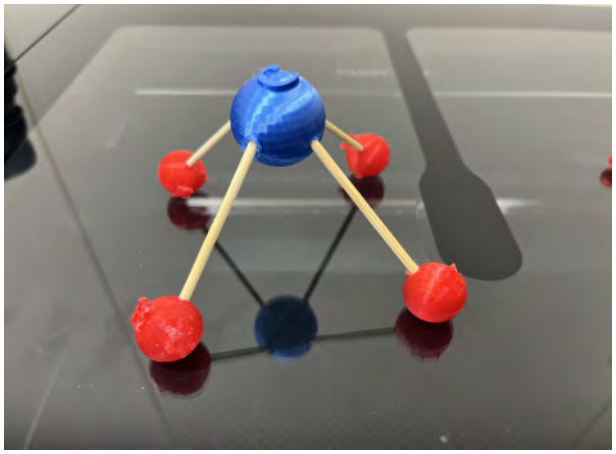





3D HYDROCARBONS

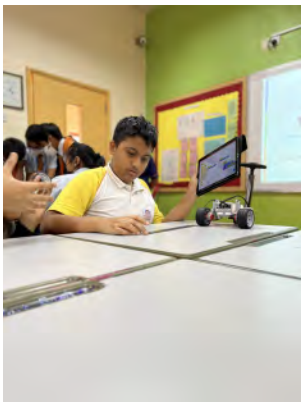
The "Animation of the Explosion and Fire at the Husky Energy Refinery in Superior, Wisconsin on April 26, 2018" served as the activity's introduction. Oxygen and the catalyst for combining hydrocarbons caused the explosion. Students were then challenged to say that the chemistry teacher at their school needs some help with the 3D models of the hydrocarbons to explain the concept of structure, valency, size, angles between the elements, etc. in the classroom.
Students worked in groups to identify a hydrocarbon that is useful in daily life. They conducted research on many structural parameters, including element valency, size, angle, and other factors. subsequently used the software Tinker CAD and 3D printers to make the 3D model of the hydrocarbons. For 3D printing, a timely produced 3D model was provided. Students looked into new aspects of 3D designing and printing that may be useful to them in the future, but they also discovered advantages and disadvantages of 3D printing that they attempted to lessen with better design.





TRIANGULAR NAVIGATION

In order to geolocation themselves using numerical coordinates (such as latitude and longitude), self-driving automobiles can use GPS. Additionally, they may navigate by fusing other digital map data with current GPS coordinates (e.g. via Google Maps). Around a five-meter circle, GPS data frequently fluctuates. A brief video of a self-driving automobile finding a route served as the introduction to the activity. Students were given the task of designing, constructing, and programming an EV3 self-driving vehicle to travel in a triangular pattern.
After constructing and connecting the robot to the application, this entire problem was further broken into mini challenges. Students measured the diameter of the wheels to determine how far the robot could travel in a single spin and displayed their results on the robot's screen. Teams of students planned to maneuver the robot around the triangle's length and width while calculating the hypotenuse to determine the shortest path. Students were driven to further develop the activity to identify the quickest path for navigation after seeing how the triangle concept was used in real life.



TRIANGULAR NAVIGATION 2

Students continued the last task by programming their robot to move along the triangle's length and width before computing the hypotenuse and displaying the result on the screen. With the help of variables and various math operators, including the square of length + square of width and square root of the whole to find the hypotenuse, they were able to program the self-driving robot to navigate. Using display blocks, they displayed the solution on the screen, which the students manually verified.
Students were asked to program the robot to cover that distance and return to the starting location after computing the hypotenuse.This was a fantastic project that helped the students better comprehend self-driving cars and navigation by introducing many technical aspects of them.